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METHOD AND APPARATUS FOR GENERATING IMAGES ON PHOTOGRAPHIC MATERIAL

~~DEVICE, METHOD AND SYSTEM FOR GENERATING IMAGES~~

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A BACKGROUND OF THE INVENTION

A1 The invention relates to a device and a method to generate photographic images per the overall concepts of Patent Claims 1 and 4 or 13 and 14, as well as to a system to generate such images.

So-called high-performance photographic printers are particularly used for the generation and production of images with which image information may be projected onto photographic material at high speed. The photographic material used is normally strip-shaped photographic paper that is supplied as a roll from a cassette to the high-performance printer. After the image information assigned to several pictures has been projected onto the strip-shaped photographic material, the numerous images transferred onto the strip-shaped photographic material are cut into separate photographs in a cutter in a subsequent step. Also, marks that are used by the cutter to cut the strip-shaped photographic material into individual photographs are placed on the strip-shaped photographic material.

It is known from the U.S. Patent No. 4,088,404 to project original images contained in photographic negatives using a

projection unit onto strip-shaped photographic material. According to the device known from this patent, the projection unit is an illumination unit with which individual photographic negatives are projected onto photographic paper in sequence. The known device contains a separate marking means with which the marks used for cutting are projected onto the photographic material. This marking means is positioned after the transfer unit so that an individual image is first projected onto the strip-shaped photographic material, then the corresponding mark used by the cutter is placed after the previously-transferred image, and finally the subsequent image is projected after the mark. According to this U.S. Patent No. 4,088,404, the marking means used is both a punching press to punch holes or indentations in the strip-shaped photographic material, as well as an additional projector with which the marks may be projected onto the strip-shaped photographic material. The known device uses a special marking means by means, of which only those marks are projected based on a previously-projected image. In particular, an inconvenient adaptation of the function of the marking means and its transfer of the mark onto the previously-performed projection of an image is necessary via the separate projection unit.

Recently, digital exposure units have been increasingly used as projection units to project image information. Such an exposure unit is known, for example, from the European Patent No. EP 0 922 993 A1. This known exposure unit includes lasers by means of which strip-shaped photographic material is exposed. Digital image data that contain the image information to be exposed are supplied to the lasers. From the European Patent No. EP 0 922 993 A1 it is also known to cut the strip-shaped photographic material, onto which the image information from several images are exposed, into individual photographs in a subsequent processing step. How the cutting of the strip-shaped photographic material is performed within the cutting unit is not described.

A method and a device to project image information onto strip-shaped photographic material, and to cut this strip-shaped photographic material, are known from the European Patent No. EP 0 947 880 A1. In this, data regarding the images or numerous images belonging to a group that are already available during projection of the image information onto the photographic material readable by machine may be projected onto the photographic material together. These data are projected onto the photographic

material in the form of special marks, e.g., a bar code, by means of the same projection unit that projects the image information. These marks, i.e., barcodes, particularly contain information regarding the height and width of the image. With the known device and the known method, several images are usually projected adjacent onto the strip-shaped photographic material. Further, the quantity of adjacent images and their position relative to a reference point such as the longitudinal strip edge is given in the bar code. The bar codes may be read and evaluated by a subsequently-positioned cutter. Thus, individual adjustment of the cutter is possible for each image or group of images, so that accurate cutting of individual photographs is possible. In order to compensate for potential influences or thermal variations during transport of the strip-shaped photographic material that might lead to stretching or shrinking of the photographic material, machine-readable end-of-image markings that are placed exactly at the end of the image or group of images are projected in addition to the bar code markings. By reading the end-of-image markings, a correction of the data contained in the bar code is made regarding the position of the individual photographs or group of images. With the known device and the known method, inconvenient

calculations of individual positions at which the strip-shaped photographic material should be cut are necessitated by the correction of the data contained in the bar code by means of the end-of-image markings.

It is further generally known that test images with test information are projected onto the photographic material in order to calibrate the projection unit to project the image information at regular distances. Marks assigned to the test information and that contain additional information regarding the type of test information are projected onto the photographic material. These marks to designate the test information are usually pressed by a punch press as holes in the photographic material. The marks might contain, for example, information regarding the format of the photographic material or the time during which the test information is projected onto the photographic material. By means of the test information, projection of image information by the projection unit may be improved in that the projection unit settings may be checked and revised. Paper consumption is increased by punching the markings to designate the test information. Further, trash is generated by the punching of the photographic material, which is a drawback.

SUMMARY OF THE INVENTION

The present invention has the objective of enabling a simple and efficient generation of images and marks on strip-shaped photographic material, and thus to enable an effective generation of images.

A2> This object is achieved by the technical lessons presented in Patent Claims 1, 4, 13, 14, 15, or 18.

Because of this invention, both the image information assigned to several pictures and the marks directly useable for cutting the strip-shaped photographic material may be projected via one and the same projector unit. Thus, two functions relevant to the generation of the images might be simply performed by one and the same projector unit. Using the projector unit, the marks used for cutting can be projected very accurately with respect to the projected image information. During the subsequent cutting step, the strip-shaped photographic material may be cut into individual photographs with very little paper waste. Particularly, an inefficient calculation by means of inconvenient correction steps is not required.

Further, based on this invention, along with image information assigned to several pictures, both test data by

means of which the projection of image information may be monitored, and marks that are to be used to designate the test data may be projected onto the strip-shaped photographic material by means of the same projector unit. Here also, more functions relevant to the generation of images may be implemented in a simple manner by means of one and the same projector unit. It is thus easily possible to perform a check of the projection of image information, and thus to ensure good quality during image generation.

In a particularly advantageous embodiment of the invention, the marks used for cutting that are projected onto the strip-shaped photographic material by the projector unit may be configured as so-called encoded marks. Such encoded marks contain additional information that may be used for image generation. Such additional information on the strip-shaped photographic material is particularly advantageous for management and order processing in a photo-finishing laboratory in which such images are generated. Such additional information may be, for example, an order identification number for the designation of each strip-shaped photographic material. The encoded marks may also be configured as beginning-of-order or end-of-order marks. With the beginning-of-order or end-of-order marks, the

first image of an order or the last image of an order may be designated. Beginning-of-order or end-of-order marks may be used in a sorting step subsequent to the cutting process to sort the individual cut images. Various information may be included in such an encoded mark, which can significantly simplify image generation.

In another advantageous embodiment of the invention, the marks used to designate test data might contain at least all information that enables identification of the device by which the test data and the mark were projected onto the strip-shaped photographic material. Thus, a clear assignment of the output test data to the device that produced the test data is ensured.

In a further, particularly advantageous embodiment of the invention, both the marks useable for cutting that may also be used to designate test data, and the test data itself may be projected via one and the same projector unit. The projector means may therefore be used within the device based on the invention for the particularly effective generation of images. Additional projector units to which the functions of the device, and thus the output of the

various marks and data, may be distributed are thus not required.

Based on the invention, it is also possible to provide several devices to create images in one system. Each of these devices is thus in the position to project test data onto the strip-shaped photographic material. The system based on the invention contains an evaluator to evaluate these various test data. This evaluator can preferably be used to evaluate test data originating from these various devices. Based on test data contained in the marks to designate the test data, a clear assignment of test data to the particular device that projected those particular test data onto the photographic material may result.

In a particularly advantageous embodiment of the system based on the invention, the various devices used to generate images and the evaluator are connected together via a network. The system based on the invention may additionally contain a controller with which adjustment of image information projection may be controlled by the various system devices based on the evaluated test data.

For the sake of simplicity, the projector unit includes lasers with which both image information and the marks are projected onto the photographic material. Such lasers may be very accurately controlled so that the insertion of marks may be very accurately adapted to the insertion of image information. Each mark used for cutting may particularly be projected onto the image inter-frame strip of the strip-shaped photographic material that is positioned between two adjacent images on the photographic material. The cutting mark may thus be directly projected onto the border of a projected image, or of one to be projected.

A3 Further advantageous embodiments of the invention may be derived from the dependent claims. In the following, the invention and its advantages are described using embodiment examples and the illustrations, which show:

Figure 1 an embodiment of the invention in a system used to generate images,

Figure 2 an example of a section of strip-shaped photographic material onto which the marks are projected,

Figure 3 a further example of the strip-shaped photographic material onto which the marks are projected that are configured as encoded marks,

Figure 4 a third example of the strip-shaped photographic material onto which test data and a mark to designate the test data are projected, and

Figure 5 an embodiment of a system to generate images based on the invention.

In the following, the same elements, or those performing the same function, are designated using consistent reference indices.

Figure 1 shows an embodiment of a system 10 to generate photographic images. With this system, image information available in the form of digital image data are projected onto photographic paper 22. The photographic paper 22 here represents the strip-shaped photographic material that is wound in rolls. To expose the photographic paper 22, the system 10 includes a printer 20 with a digital exposure unit 13 to which the digital image data are added to the image information to be projected. In this embodiment, the

exposure unit 13 contains lasers by means of which three laser beams are created in the red, green, and blue spectral ranges. These laser beams are modulated with the image information using a list modulator. The exposure unit 13 here represents a projector unit to project the image information. Other exposure means, such as LED's, for example, may be used as such a projector unit. It is also possible to use ink jets as the projector unit to project image information. Paper may be imprinted using such ink jets. This paper is preferably configured for receiving such ink. Both exposure units such as lasers and printing units such as ink jets should be included under the concept "projector unit to project image information onto the strip-shaped photographic material."

The strip-shaped photographic paper 22 wound in rolls is available in a cassette that is coupled to the printer 20. The strip-shaped photographic paper 22 is supplied to the printer in a transport device A. A first pair of transport rollers 11 is positioned behind the entry to the printer 20 that includes two rollers mounted one above the other so that they may rotate, between which the strip-shaped photographic paper 22 passes. The photographic paper 22 is transported into the printer 20 toward the exposure unit 13

by means of the pair of transport rollers 11. The pair of transport rollers 11 is connected with a controller 15 by means of which the entire procedure of generating an image within the printer 20 based on the device may be controlled. The pair of transport rollers 11 receives individual control signals from the controller 15 with which the transport speed of the photographic paper 22 may be adjusted.

Below the exposure unit 13, a paper stage 12 is positioned within the printer 20. This paper stage 12 serves to guide the photographic paper 22 during exposure by means of the exposure unit 13. A second pair of transport rollers 14 is positioned at the exit from the printer that also includes two rollers mounted so that they may rotate and serve to transport the strip-shaped photographic paper 22. The pair of transport rollers 14 is also connected with the controller 15, and receives control signals from it to adjust the rotational speed of the rollers, and thus the transport speed of the photographic paper 22.

The printer 20 further includes an input device 21 through which the digital image data may be provided to the printer with the image information to be projected. Digital image

data with image information may originate from a conventional scanner that reads the image information from individual photographs on a photographic film and transforms it into digital image data. It is also possible, however, that the digital image data be stored on diskettes, CD-ROM, etc., and that the input interface 21 might include a corresponding reader to read such a medium. Further, the input interface 21 may be connected with a public data network such as the Internet, for example, by means of which the digital image data might be supplied directly to the printer 20 from a remote input station connected to the Internet. The input interface 21 is connected with the controller 15, and passes on the digital image data, and any accompanying data, to the controller 15. Such accompanying data might, for example, include the desired format for the generation of the images. The controller 15 preferably prepares the image data received at the input interface 21. By means of this preparation, the exposure may be adapted by means of the exposure unit 13 to the properties of the photographic paper used.

The controller 15 is connected via a connection line 27 with the exposure unit 13. The controller 15 transfers the prepared images via this line 27 to the exposure unit 13.

Since the prepared image data contain exactly that image information that is to be projected onto the strip-shaped photographic paper 22, the laser beams emitted from the exposure unit 13 are modulated by this image information. The controller 15 is connected with the exposure unit 13 via an additional connection line 28. The exposure unit 13 receives control signals via this additional line 28 that serves to project marks onto the strip-shaped photographic paper 22 by means of the exposure unit 13. These marks are used for subsequent cutting of the photographic paper 22 into individual photographs. The connection lines 27 and 28 may also be implemented as a single connection between the controller 15 and the exposure unit 13. Both the image data to be projected and the control signals for the projection of the marks may be transferred via this single connection from the controller 15 to the exposure unit 13.

The control signals generated by the controller 15 and passed to the exposure unit 13 via the additional connection line 28 for the projection of the marks are so transferred that immediately after projection of the image information, the mark is directly projected onto the edge of the exposed latent image. By means of this direct adaptation of the marks with the exposure of the image onto

the strip-shaped photographic paper 22, only a very narrow inter-frame strip is created between two latent images projected onto the photographic paper 22. Two adjacent latent images generated can basically be projected directly adjacent each other, since the marks used for cutting may be made very narrow. The exposure unit 13 is in the position to create such a narrow mark on the photographic paper 22. Correspondingly, a cutter device, which serves for the subsequent cutting of the strip-shaped photographic paper 22, must be able to discern this narrow mark accurately. It may thus be ensured that cutting into individual photographs loses none of the image information available at the margins of the images projected onto the strip-shaped photographic paper 22. It is alternatively also possible to project the marks used for cutting first, and then to project the accompanying image via the exposure unit 13.

After the printer, a development device in the form of a photographic paper developer 16 is positioned, by means of which the exposed photographic paper 22 may be developed. The latent images contained in the photographic paper 22 are fixed in the developer 16 so that a large number of individual photographic images are contained on the strip-

shaped photographic paper 22 at the output of the developer 16.

A cutting device 17 with which the strip-shaped developed photographic paper 22 may be cut into individual photographs is positioned along the paper transport direction and after the photographic paper developer 16. For this, the photographic paper 22 exiting from the developer 16 is fed into the cutting device 17. An additional pair of transport rollers 19 positioned directly before the cutter 17 serves to transport the strip-shaped photographic paper within the cutter 17. The cutting device 17 contains a cutter 18 with which the strip-shaped photographic paper 22 may be longitudinally and latitudinally cut. The desired photographs are cut from the strip-shaped photographic paper 22 by the cutter 18. The cutter 18 is here a single-blade cutter with which the strip-shaped photographic paper 22 may be cut at exactly the position where the mark is located on the photographic paper 22. The cutter 18 may be a single-blade cutter here, since the mark is very narrow, so that essentially no image inter-frame strip is present between two adjacent images on the photographic paper 22. The cutter 18 may also be a two-blade cutter capable of making a double cut by means of

which the entire mark and any borders present may be cut away.

A sensor 24 is positioned between the transport roller pair 19 and the cutter 18. This sensor 24 serves as the detector to detect the marks projected by the exposure unit 13 onto the photographic paper 22. The developed strip-shaped photographic paper 22 is passed adjacent to the sensor 24. If the sensor 24 detects a hole or mark, this information is used to cut the photographic paper 22 by means of the cutter 18. The sensor 24 is preferably positioned directly before the cutter 18 so that the cutting process is registered as accurately as possible with the recognized position of the mark. Since the exposure of the image information is very accurately registered with the exposure of the mark by the exposure unit 13 within the printer 20, such registration of the cutting with the detection of the mark within the cutting device 17 may lead to optimal use of the photographic paper 22 during the projection of multiple images. The paper loss encountered during cutting the photographic paper 22 into individual photographs that may arise from the cutting away of the borders and marks may thus be kept very small. With very accurate positioning of the marks projected by the exposure unit 13, it is

possible to emplace the individual photographs directly at the marks during exposure via the exposure unit 13. With properly accurate detection of the mark within the cutting device 17, the strip-shaped photographic paper 22 may be cut so exactly that it is no longer necessary to have to cut away a portion of the image information on the margin of an individual image in order to avoid an undesired image border. The sensor 24 may be configured in many ways, so long as it is ensured that the marks may be recognized with a high degree of reliability. The detector within the cutting device 17 is adapted to the type of the marks projected onto the photographic paper 22 by the exposure unit 13.

The individual photographs created by the cutting device 17 are now transported out of the cutting device 17 and passed to a sorting device 25 via another pair of transport rollers. The individual photographs are sorted in this sorting device 25. For this, the sorting device 25 includes several sorting compartments 26a, 26b, and 26c in this embodiment, as Figure 1 shows. Individual photographs are distributed to the sorting compartments 26a, 26b, and 26c by the sorting device 25 (not shown in detail). Distribution of the individual photographs depends on

information that is passed to the sorting device 25. The sorting device 25 is connected with the cutting device 17 in order to receive this additional information. It is also possible to connect the sorting device 25 to the controller 15 and to pass the additional information to the sorting device 25 via the controller 15. This additional information used to sort the individual photographs might be order-specific data. All photographs from the same order might be distributed into the same sorting compartment, for example.

The additional information used in the sorting device 25 to sort the individual photographs is preferably already contained in the marks. Such marks are designated as so-called encoded marks, which are widely known. In this embodiment, these encoded marks are already projected onto the photographic paper 22 by means of the exposure unit 13. The encoded marks are also used to cut the strip-shaped photographic paper 22 into individual photographs by the cutting device 17, and to sort the individual photographs within the sorting device 25. The encoded marks may particularly be configured as beginning-of-order or end-of-order markings. Such a beginning-of-order mark is placed before or after the first image of the order to be exposed,

and the end-of-order mark may be placed before or after the last image of that order. The beginning-of-order or end-of-order mark is detected by the sensor 24 within the cutting device 17, and the information regarding the detection of the proper mark is then passed to the sorting device 25. In this manner, all photographs of a specific order may be distributed into the same sorting compartment 26a, 26b, or 26c of the sorting device 25. The encoded marks projected onto the photographic paper 22 might also contain other information that might, for example, be used for procedure control within the photo-finishing laboratory in which the system to generate images as shown in Figure 1 is used.

Figures 2 and 3 show two examples of marks projected onto strip-shaped photographic paper that may be used to cut the photographic paper. Figure 2 shows the first example of a portion of a strip-shaped photographic paper 30 as described for Figure 1 that was exposed with image information assigned to individual photographs. In the portion of the strip-shaped photographic paper 30 shown in Figure 2, three marking sections 35a, 35b, and 35c are shown. A cutting mark 34 is projected onto photographic paper within each of these three marking sections 35a - 35c. These cutting marks 34 are projected onto the

photographic paper 30 within the marking sections 35a - 35c at the upper edge of each exposure unit 13.

Sectional areas are defined by the marks 34 projected onto the three marking sections 35a - 35c that are used for the projection of image information of an image by means of the exposure unit 13. A first sectional area 31 is shown to the right of, and adjacent to, the first marking section 35a that is to be used, or has already been used, for the exposure of the (n-1) image of a specific order k, depending on whether each mark 34 is projected before or after projection of the image information. n thereby corresponds to the number of images contained in the order. A second sectional area 32 is shown to the left of, and adjacent to, first marking section 35a on the strip-shaped photographic paper 30 that is used for the projection of an n^{th} image of order k. The second sectional area 32 is formed by the first marking section 35a and the second marking section 35b. The second sectional area 32 has a length b. A third sectional area 33 is present to the left of, and adjacent to, the second marking section 35b, and the mark 34 contained within it. This third sectional area 33 serves to project the first image of a following order (k + 1). The third sectional area 33 is formed by the second marking

section 35b and the third marking section 35c. The third sectional area 33 has a length of c.

The marks 34 here are each a round mark. They have a specific size by means of which the length of each marking section 35a - 35c is essentially determined. In this embodiment example per Figure 2, the marking sections 35a - 35c each have a length a. The marking sections 35a - 35c are not used for the projection of image information. Rather, the marking sections 35a - 35c are cut away after projection of the image information in the printer 20 with the cutting device 17. The marking sections 35a - 35c that have been cut away thereby represent waste. Based on this invention, both the projection of the marks and the cutting of the photographic paper 22 may be registered very exactly with the position of each image. The amount of waste generated during the generation of images may therefore be minimized.

Another mark 39 is projected onto the lower border of the first marking section 35a that is also configured as a round hole. This mark 39 serves as the end-of-order mark. The last photograph of an order is designated with the end-of-order mark 39. In this example, the second sectional

area 32 is that area on the photographic paper 30 that serves for the exposure of the last image n of the order k. During subsequent sorting of the individual photographs within the sorting device 25 (Figure 1), the previously-detected end-of-order mark 39 is used to direct the exposed image in the second sectional area 32 as the last photograph distributed to the sorting compartment 26a, 26b, or 26c into which the previously-generated images of order k have been sorted. Using the end-of-order mark can ensure that the image projected onto the third sectional area 33 is distributed to a different sorting compartment by the sorting device 25. In this manner, images from different orders may be easily identified and sorted separate from one another.

Figure 3 shows another example of a section of the strip-shaped photographic paper 30 onto which several marks used for cutting are projected. The marks shown in Figure 3 are configured as so-called encoded marks. A first encoded mark 36 is projected onto the first marking section 35a. This first encoded mark 36 contains a rectangular, extended mark in the upper area of the first marking section 35a. The first encoded mark 36 contains a round mark in the center area of the first marking section 35a, and a rectangular,

short mark in the lower area. A second encoded mark 37 is projected onto the second marking section 35b. This second encoded mark 37 also contains a rectangular, extended mark in the upper third of the second marking section 35b. A rectangular, short mark is projected onto the lower third to the marking section 35b. The third marking section 35c contains a third encoded mark 38. This contains a rectangular, extended mark in the lower third of the third marking section 35c.

The positions of marks 34 - 38 are determined by the controller 15 of the system to generate images based on the invention. The controller 15 encompasses the length required for the projection of the pertinent image onto the photographic paper 30.

Figure 4 shows a third example of a section of the strip-shaped photographic paper 30. Several marks that are used for cutting are projected onto this section of the strip-shaped photographic paper 30, as in Figure 2. The information and marks projected onto the section shown were projected onto the photographic paper 30 by means of the printer 20 shown in Figure 1 and described with Figure 1. Three marking sections 50a, 50b, and 50c are shown in the

section of the strip-shaped photographic paper 30 shown in Figure 4. One cutting mark 34 is projected onto each of these three marking sections 50a, 50b, and 50c. These cutting marks 34 are projected onto the strip-shaped photographic paper 30 within the marking sections 50a - 50c at each top border by the exposure unit 13 (Figure 1).

The marks 34 projected into the three marking sections 50a - 50c define partial areas that serve for the projection of image information of an image or test information to check the projected image information by means of the exposure unit 13. A partial area 51 is shown to the right, next to first marking section 50a, that is to be used for the projection of an image i of a specific order j, or has already been used for this, depending on whether each mark 34 was projected onto the photographic paper 30 before or after the image information of the image i. Another partial area 52 is present on the strip-shaped photographic paper 30 to the left, next to the first marking section 50a. This additional partial area 52 is divided into a first, lower section 55 and a second, upper section 56. Test information 57 is projected onto the second, upper section 56. The test information 57 contains various gray-scale shades 58 - 66 that are projected into the second section 56 as adjacent

rectangles. The first gray-scale shade 58 positioned at the left edge of the partial area 52 is the lightest gray-scale shade, and the gray-scale shade 66 positioned at the right edge of the partial area 52 is the darkest gray-scale shade. The various gray-scale shades 58 - 66 are positioned directly adjacent to each other, with brightness decreasing from right to left.

The test information 57 serves to check the function of the printer 20 and the photographic paper developer 16 positioned after the printer (Figure 1). The degree of effectiveness of particularly the chemical reagents present in the developer that are used to develop and fix the photographic paper changes in the course of on-going production. An evaluation of the test information 57 that has passed through the developer and fixing baths may serve as a basis for correction of the exposure of the photographic paper 30 when the image is generated by means of the exposure unit 13. It is possible via the controller 15 to alter the exposure via the exposure unit 13 correspondingly if the evaluation results of the evaluation of the test information 57 are passed to the controller 15. Exposure parameters for the projection of images via the

exposure unit 13 may be adapted to the altered reaction of the developer and fixer baths in the developer 16.

A mark 54 to designate the test information 57 is projected onto the first section 55 of the partial area 52. In this embodiment, this mark 54 is configured as a bar code. It is equally possible to configure the mark 54 to designate the test information 57 in another manner, e.g., as an encoded mark as described for Figure 3. The bar code 54 here contains information used to identify the printer 20 with which a reference is established between the test information 57 and the exposure unit 13 or the printer 20 that projected the test information 57. The bar code may further contain information regarding the format of the photographic paper 30 or the time during which the test information was projected onto the photographic paper 30.

The partial area 52 is defined by the marking section 50a and the marking section 50 b adjacent to its left. The partial area 52 has a length d. A third partial area 53 is present on the strip-shaped photographic paper 30 to the left of the marking section 50b and of the mark 34 contained within it. This third partial area 53 (as does the first partial area 51) serves to project an image i + 1

of a specific order. This image i + 1 to be projected in the third partial area 51 may belong to order j as did image i that was projected into the first partial area 51. In this case, the test information 57 and the bar code 54 are projected between two images that belong to the same order j. It is equally possible to append the test information 57 and the bar code 54 directly to the end of an order. In this case, the image to be projected into the third partial area 53 would belong to different order m than the image i. The third partial area 53 is formed by the marking section 50b and the marking section 50c to the left of the partial area 53. The third partial area 53 here has a length e. In the case in which the test information 57 and the bar code 54 are appended to the end of the order, an end-of-order mark may be projected in the marking section 50b at the lower edge of the strip-shaped photographic paper 30. It is also equally possible to project a beginning-of-order mark in the marking section 50a. This beginning-of-order mark is preferably projected onto the lower edge of the photographic paper 30, as was done with the end-of-order mark projected into the marking section 50b. The marks 34 in this embodiment per Figure 4 are each a round mark. They correspond to the marks that

were previously described for the embodiment per Figure 2. The marking sections 50a - 50c each have a length a.

Figure 5 shows an embodiment of a system 140 based on the invention. This system 140 contains, in addition to the system 10 to generate images as described in the embodiment per Figure 1, two other systems 70 and 80 for the generation of images that are constructed the same as the system 10 and that may perform the same functions. Both systems 70 and 80 are also connected to a network 100, as is system 10. This network 100 may be, for example, a public communication network such as the Internet, or other network not accessible by the public such as a Local Area Network (LAN).

The system 70 contains, among other things, a printer 71 by means of which image information may be projected to generate an image. This also applies for the third system 80 that includes a printer 81. The design of the printers 71 and 81 corresponds to that of the printer 20 of the system 10. The outputs of the systems 10, 70, and 80 are each connected with a sorting device 90. The photographs produced by the systems 10, 70, and 80 may be so sorted by the sorting device 90 that photographs of one order that

were distributed to various systems 10, 70, or 80 for exposure may again be collected together.

Along with the systems 10, 70, and 80, an evaluator 130 and a detector 120 are connected to the network 100. The evaluator 130 serves to evaluate the test information projected onto the photographic paper 30 from the systems 10, 70, and 80. The evaluator 130 may particularly be a densitometer. Densitometers are measurement devices with which particularly the optical density of the test information projected onto the photographic paper 30 may be determined. The detector 120 connected directly evaluator 130 issues the bar code assigned to the test information. The detector 120 here is a bar-code scanner. The information read from the evaluator 130 and the detector 120 are passed to a controller 110 that is connected both with the network 100 and with the evaluator 130. The controller 110 controls information issued by the evaluator 130 and the detector 120 so that the printers 20, 71, and 81 used to project the image information may be adjusted in dependence upon the evaluated test information and the assignment received from the bar code for the printers 20, 71, and 81. It is thus ensured that each printer 20, 71,

and 81 is only adjusted based on the test information that is projected by them onto the photographic paper.

In the embodiments per Figures 4 and 5, it was described how the mark 54 used to designate the test information 57 was projected by the exposure unit 13. This exposure unit 13 should project both the test information and the image information onto the photographic paper 30 that are required to generate the images for various orders. It is also equally possible to project the mark 54 onto the photographic paper 30 via another projection unit. The mark 54 may, for example, also be projected via a rear-side printer onto the rear side of the photographic paper 30.

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